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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/878,955

06/13/2001

Mitsuteru Inoue

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06/01/2004

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EXAMINER

MARTINEZ, JOSEPH P

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 06/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/878,955

Applicant(s)

INOUE ET AL.

Examiner

Joseph P. Martinez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 7-11 is/are rejected.
- 7) ☒ Claim(s) 4-6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6 and 7.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 8-9 and 11 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Tanielian et al. (5473466).

Re claim 1, Tanielian et al. teach for example, a spatial light modulator comprising: a magnetic layer (layer 16, fig. 3) that is made of a magneto-optic material (col. 3, ln. 52-60) and includes a plurality of pixels (pixel 12, fig. 3) in each of which a magnetization direction is independently set and each of which has a function of causing a rotation of a polarization direction of incident light depending on the magnetization direction by a magneto-optic effect (col. 4, ln. 65-67 tot col. 5, ln. 1); a plurality of first conductor layers (windings 26 and 30, fig. 3) and a plurality of second conductor layers (windings 26 and 30, fig. 3) arranged to intersect with each other at positions corresponding to the individual pixels (fig. 3), through which currents for generating magnetic fields to set the magnetization directions in the individual pixels are passed

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(col. 5, ln. 50 -62); and a plurality of dielectric layers for enhancing the function of the pixels (dielectric layers 14 and 28, fig. 3).

Re claim 8, Tanielian et al. further teach for example, an incidence/outgoing plane (surface of device 10, fig. 3) on and of which light is incident and goes out; and a reflective layer that reflects light and is provided at a side opposite to the incidence/outgoing plane with the magnetic layer interposed therebetween (fig. 3, col. 8, ln. 3-11).

Re claim 9, Tanielian et al. further teach for example, an optical rotatory layer (epitaxial layer 16, fig. 3) that is provided to be adjacent to the incidence/outgoing plane and rotates a polarization direction of passing light by a predetermined angle by the magneto-optic effect (col. 3, ln. 52-61).

Re claim 11, Tanielian et al. further teach for example, the magnetic layer is formed of a magnetic thin film (col. 3, ln. 52-61).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanielian et al. (5473466).

Re claim 2, Tanielian et al. teach the spatial light modulator as disclosed above, including the first magnetic layer, the first conductor layers, the second conductor layers and the dielectric layers.

But, Tanielian et al. fail to explicitly call the associated elements a one-dimensional magnetophotonic crystal.

However, the office interprets the teachings of Tanielian et al. to include all of the elements of a one-dimensional magnetophotonic crystal and furthermore all of the elements of Tanielian et al. perform together to function as a one-dimensional magnetophotonic crystal, as disclosed.

Therefore, the office interprets the teachings of Tanielian et al. to include a one-dimensional magnetophotonic crystal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Tanielian et al. to incorporate nomenclature that is well known in the art for purposes of clarity of teaching.

Re claim 3, Tanielian et al. teach the spatial light modulator as disclosed above, including the first conductor layers and the second conductor layers.

But, Tanielian et al. fail to explicitly teach the first conductor layers and the second conductor layers are placed to sandwich the magnetic layer.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange the order of the structure and sandwich the magnetic layer with

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the first conductor layers and the second conductor layers, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the spatial light modulator of Tanielian et al. to place the first conductor layers and the second conductor layers to sandwich the magnetic layer in order to further enhance the illumination provided by the pixels.

Re claim 7, Tanielian et al. teach the spatial light modulator as disclosed above, including the first conductor layers and the second conductor layers, and further including that the spatial light modulator can operate as a transmissive device (col. 8, ln. 3-6).

But, Tanielian et al. fail to explicitly teach the first conductor layers and the second conductor layers are transparent to the incident light.

Official Notice taken. It is well known in the art of spatial light modulators to provide conductive layers that are transparent to incident light.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the spatial light modulator of Tanielian et al. to include transparent conductor layers to further increase the transmission of incident light.

Re claim 10, Tanielian et al. teach the spatial light modulator as disclosed above, including the transparent epitaxial layer (layer 16, fig. 1) deposited in between pixels (pixels 12, fig. 1).

But, Tanielian et al. fail to explicitly teach a magnetic domain wall movement inhibiting portion that is provided at a boundary position between adjacent ones of the pixels and inhibits movement of a magnetic domain wall beyond the boundary position.

However, the office interprets the transparent epitaxial layer (layer 16, fig. 1) deposited in between pixels (pixels 12, fig. 1) to structurally perform the function of inhibiting the magnetic domain wall form movement.

Therefore, due to the structure of Tanielian et al. the disclosed limitations are taught.

Allowable Subject Matter

Claims 4-6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art taken alone or in combination fails to anticipate or fairly suggest the limitations of the claims, in such a manner that a rejection under 35 USC 102 or 103 would be proper.

The prior art fails to teach a combination of all the claimed features as presented in dependent claim 4, wherein the claimed invention comprises a spatial light modulator, a magnetic layer, a plurality of first and second conductor layers, a plurality of dielectric layers and wherein the first conductor layers and the second conductor layers each include narrow portions each having a width smaller than that of another of another portion, and the narrow portions of the first conductor layers and the narrow portions of the second conductor layers are arranged to overlap with each other, as claimed.

Dependent claims 5-6 are further objected to because they depend upon claim 4.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph P. Martinez whose telephone number is 571-272-2335. The examiner can normally be reached on M-F 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
3-1-04


Hung Xuan Dang
Primary Examiner